

XXV. NWA 998

clinopyroxenite

456 grams



Figure XXV-1: Photograph of 165 g end piece of NWA 998 by Adam and Greg Hupé.

Introduction

Irving *et al.* (2002) report that a piece of a nakhlite was acquired in Morocco in September 2001. Figure XXV-1 shows what appears to be a broken “slab”, with a fusion crust around the outside.

Petrography

The texture of NWA 998 is that of a hypabyssal, adcumulate igneous rock. According to Irving *et al.* (2002), the crystallization sequence was olivine, orthopyroxene, titanomagnetite, augite, apatite and plagioclase. This meteorite may not be highly shocked.

Mineral Chemistry

Olivine: Olivine is Fo_{36} .

Pyroxenes: The dominant mineral is clinopyroxene $\text{Wo}_{39}\text{En}_{78}$. Minor orthopyroxene is $\text{Wo}_4\text{En}_{51}$. Pyroxene contains tiny melt inclusions.

Plagioclase: Interstitial plagioclase exhibits normal birefringence and is An_{39} . Plagioclase is blocky, rather than sheath-like as in other nakhlites.

Opakes: Symplectitic intergrowths of titanomagnetite and low-Ca pyroxene are present at grain boundaries between large, discrete olivine and titanomagnetite grains. Cr-titanomagnetite inclusions occur within olivine.

Secondary minerals: Ankeritic carbonate, K-feldspar, (?) serpentine, calcite and a Ca-sulfate are present on grain boundaries. Irving *et al.* (2002) suggest that these *secondary minerals* may have a pre-terrestrial origin.

Whole-rock Composition

None reported

Other Isotopes

Oxygen isotopes of acid-washed augite, as determined by D. Rumble (reported by Irving), were $\delta^{18}\text{O} = +3.9 \pm 0.2$, $\delta^{17}\text{O} = +2.2 \pm 0.01$ and $\Delta^{17}\text{O} = +0.24 \pm 0.01$ ‰.